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DISCOVERY OF
Surgical Anaesthesia

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DISCOVERY OF SURGICAL ANAESTHESIA.*

By E. M. MAGRUDER, M. D., Charlottesville, Va.

While a medical student in the eighties I first became acquainted with the term "Surgical Anaesthesia," and was vaguely cognizant of the fact that *some one* had discovered it and that there had been a controversy concerning the discovery with several claimants of the honor; but I was not in possession of any data bearing upon their respective claims.

In 1904, as local surgeon of the Southern Railway Company, at Charlottesville, I was called to a wreck south of my town and met, among the less seriously injured passengers of the damaged train, a charming lady who introduced herself as Mrs. Frances Long Taylor of Mississippi, the daughter of Dr. Crawford W. Long. The injured from that wreck were brought to Charlottesville for treatment and for a week I had the privilege of ministering to the daughter of one of the men whose connection with the discovery of Surgical Anaesthesia has made him famous.

As a consequence I learned much about the discovery and interest, which had been smouldering for years, was fanned into a blaze.

*Read before the Association of Surgeons of the C. & O. Railway, at White Sulphur Springs, W. Va., September 5, 1914.

In the preparation of this paper the facts were obtained through the above mentioned acquaintance and from writings of those who have profoundly studied the subject in its every detail. Much valuable material was loaned me by the families of Drs. Long and Morton and I desire to make especial acknowledgment of obligation to the work in this line of Drs. Hugh H. Young and Wm. H. Welch of Baltimore, George Foy of Dublin, Ireland, Dudley W. Buxton of England, John Chalmers Da Costa of Philadelphia, J. Marion Sims of New York, Hansell Crenshaw and L. B. Grandy of Atlanta, Isham H. Goss of Athens, Ga., Fred J. Haskings, J. M. Taylor, Westmoreland, J. Collins Warren of Boston, W. J. Morton of New York, Miss Rosa P. Chiles, and others, from whose work I take the liberty of copious quotations. In fact, this is largely an abstract prepared with much labor from the work of others with original additions of my own.

Four men, Americans, Jackson, Wells, Morton and Long, claimed the honor of discovering Surgical Anaesthesia, and for eight years a bitter controversy was waged in the surgical world as well as in the Congress of the United States as to who deserved the honor. It is not, however, so much my purpose to attempt to prove the justice of individual claims, as this has already been done most conclusively by others; but this paper is intended to be

historical rather than *judicial* and proposes to present in condensed, available and chronological form, the history of the grandest discovery of the universe, the circumstances leading up to it, and the controversy to which it gave rise, giving credit where credit is due.

There are seven epoch-making discoveries connected with the profession of medicine which stand forth pre-eminently in conducing to success in the treatment of disease; these are, circulation of the blood (Harvey), vaccination (Jenner), hypodermic medication (Prevez), surgical anaesthesia (Long), the germ theory (Pasteur), aseptic surgery (Lister), and serum therapy (Von Behring).

Anaesthesia means insensibility to pain and other external impressions, which may involve a part or the whole of the body.

Surgical Anaesthesia is insensibility to pain during a surgical operation, and the substance used to produce this insensibility is called an anaesthetic, of which there are two varieties, *local* and *general*.

Some agents, as cold, cocain, eucain, novocain, ethyl chloride, when applied directly to a part of the body, produce local anaesthesia over a limited area. Other agents, all of which are volatile, as ether, chloroform, nitrous oxide ("laughing gas"), somnoform, when inhaled, produce general anaesthesia.

Before the discovery of surgical anaesthesia surgery was very painful, many patients dying

from shock due to pain, and constant effort had been made from the earliest times to devise means of doing away with this horrible accompaniment.

In 1839, Velpeau of Paris wrote: "To escape pain in surgical operations is a chimera which we are not permitted to look for in our day;" and as late as 1846 Sir Benjamin Brodie wrote, "Physicians and surgeons have been looking in vain from the days of Hippocrates (460 B. C.) down to the present time for the means of allaying or preventing pain" in surgery (Buxton). Some of the agents used were opium, cannabis indica, and mandrake, by inhalation, the magnet, whiskey and brandy to drunkenness, the local application of cold in the form of ice, compression of the carotid arteries, nerve compression, bleeding to syncope. None of these, however, were satisfactory and patients endured the agony of the knife securely strapped to the operating table to insure immobility.

In the language of one of the above mentioned gentlemen, anaesthesia dates from Adam when "The Lord caused a deep sleep to fall upon Adam and he slept; and he took one of his ribs and closed up the flesh instead thereof."

In the last part of the 18th century "Mitchell, in his work on Chemistry, declared that nitrous oxide was a '*virulent poison*'; but in 1799 Sir Humphrey Davy, after making researches, concluded that Mitchell was wrong and announced

that "The inhalation of nitrous oxide produced insensibility and had cured the pain of an aching tooth," adding these portentous words, "As nitrous oxide appears capable (by inhalation) of destroying pain it may probably be used with advantage during surgical operations in which no great effusion of blood takes place" (Buxton).

It is on record that in March, 1800, William Allen, a lecturer on chemistry, demonstrated in the presence of Sir Astley Cooper and others in Guy's Hospital, London, the phenomena of nitrous oxide inhalation, noting especially the loss of sensation to pain. The great surgeon, above mentioned, failed to appreciate the momentous possibilities involved, and the demonstration fell upon barren soil.

"Pareira in his *Materia Medica* of 1839 states that nitrous oxide produces pleasing delirium, desire to dance, fight, etc., and sometimes *stupor*. He recommended it for spasmodic asthma" (Da Costa).

"No one took the hints of Davy and Allen and nitrous oxide for the next 45 years was used by travelling lecturers who gave it on the public stage to members of their audiences to provoke exhilaration, excitement, semi-conscious gyrations, and mirth-producing antics, as laughing, crying, pugnacity, etc., for the amusement of the spectators. It is said that these exhibitions were common to the English people and soon spread to the United States.

But nitrous oxide was found so troublesome to manufacture and manipulate that Pearson (of England) suggested and Cullen and Warren (of Boston) advocated the use of ether vapor instead of nitrous oxide, as it was known to have similar effects" (Buxton).

"Ether had been known for several centuries, but for many years it was regarded as too dangerous to be used. As early as 1795, however, Pearson (of England) had used with benefit the vapor of sulphuric ether in spasmodic affections of respiration, as in spasmodic asthma and phthisis: and in 1818 Farady announced 'when the vapor of ether mixed with common air is inhaled it produces effects similar to those of nitrous oxide gas' (exhilaration, excitement, laughter, crying, pugnacity, insensibility, etc.)."

The fact that sulphuric ether could produce insensibility had been shown by several American physicians, Godwin (1822), Mitchell (1832), Jackson (1833), Wood and Bache (1834). "Wood recommended its inhalation for spasmodic conditions and Physick used it in pulmonary affections. In 1839 Pareira, in his *Materia Medica*, stated that the vapor of ether was inhaled to relieve the effects of the accidental inhalation of chlorin gas (which causes spasm of the throat muscles) and also recommended it for dyspnoea, as in asthma, whooping cough, chronic catarrh, phthisis, etc.", (Da Costa), stating finally that, "if the

air be too strongly impregnated with the ether, stupefaction ensues."

"In the first half of the 19th century, Professor Thomson of Glasgow amused his students by permitting them to inhale nitrous oxide and ether vapor until they became unconscious and appeared to be insensible to pain" (Goss).

"In the year 1841, Esdaile in India successfully operated without pain upon hypnotized patients, and Elliotson (of England) advocated hypnotism and mesmerism as an anaesthetic in surgery. In 1843 Elliotson published a book entitled 'Surgical Operations Performed in the Mesmeric State without Pain.' About this time (1841-1846) hypnotism or mesmerism was accepted and used by many eminent physicians and surgeons, both in the United States and France, as *the* anaesthetic in surgery and was advocated by the public press" (Buxton), although it met with some opposition in the medical profession.

For a number of years, therefore, previous to the Discovery of Surgical Anaesthesia it had been known that nitrous oxide gas and ether vapor when inhaled would produce exhilaration and excitement and, if the inhalation were continued, insensibility and anaesthesia would be produced; that inhalation of nitrous oxide gas would relieve tooth ache and the dyspnoea of spasmodic asthma, and that ether vapor so used would relieve dyspnoea due to chlorin

gas poisoning, spasmodic asthma, whooping cough, chronic catarrh, and phthisis.

These two drugs were then also extensively used by inhalation, North and South, to furnish entertainment both on the public stage and at private social gatherings, ether being the favorite. These curious affairs were called "Nitrous Oxide or Ether Frolics." Young people inhaled these drugs for their exhilarant and excitant effects and the strange antics of those under their influence caused amusement for the spectators.

"Mighty oaks from little acorns grow." Great events are sometimes founded upon trifles. Robert Bruce was encouraged to continue his efforts for the liberty of Scotland by watching a spider build his web. Newton conceived the law of universal gravitation by seeing an apple fall to the ground. Franklin proved the identity of lightning with electricity by sailing a kite. Watt discovered the expansive power of steam by watching a tea-kettle boil. The discovery of Surgical Anaesthesia, the world's grandest possession, was due to the absurd practice of inhaling ether and nitrous oxide for the purpose of causing mirth-producing antics.

It was near the middle of the nineteenth century that it was discovered that by the inhalation of ether vapor and nitrous oxide gas general anaesthesia could be produced so com-

plete that surgical operations could be performed without pain to the patient.

Charles Thomas Jackson.

Charles Thomas Jackson was born in Massachusetts in 1805, graduated in medicine from Harvard Medical College in 1829, and immediately went to Paris, the Mecca of medical men of that day, and spent three years studying there. In 1831 he made a pedestrian tour of Europe and was in Vienna during a cholera epidemic, where he assisted in the dissection of the bodies of 200 cholera victims.

In 1833 he began the practice of medicine in Boston, but soon gave it up to devote himself to chemistry, mineralogy, and geology, becoming the state geologist successively of Maine, Rhode Island, and New Hampshire. In 1837 he had a controversy with Morse, claiming the invention of the telegraph. In 1844 he explored the Southern shores of Lake Superior and in 1847-9 was United States surveyor of mineral lands in Michigan. He received many honors from foreign societies and governments and was a physician, chemist, and scientist, of high reputation.

In February 1842 Jackson (probably during some chemical experiments) accidentally inhaled chlorin gas, which caused intense spasm and suffering in the throat, and was relieved by inhaling the vapor of sulphuric ether, which

Pareira in 1839 had already stated was a known remedy for chlorin gas poisoning.

Jackson afterwards claimed that, at the time of his relief by ether, he had *thought* it might answer as an anaesthetic in surgery and that more than a year later, in 1843, he *suggested* this use of it to some medical friends; but he did not try it himself and no notice was taken of his suggesstion, the same fate that befell Davy's suggestion, in 1799, with regard to nitrous oxide.

When Wells came to Boston in January 1845, with the news of his successful use of nitrous oxide in dentistry on December 11, 1844, neither Doctors Jackson, Morton, Warren, Bigelow, Hammond, nor any one else, seemed to attach any importance to it after his failure in the Hospital and they all allowed Wells to return to Hartford discomfited and discouraged.

Some time in 1846, however, it is said that Jackson was consulted by Morton, who was living with him and studying medicine, with regard to some agent that might be used to annul pain in dentistry and suggested the inhalation of ether and made scggestions concerning the apparatus for administering it, both of which Morton successfully tried September 30, 1846, and painlessly extracted a firmly rooted tooth.

When Morton sought legal advice, October 1, 1846, with a view to obtaining a patent on the anaesthetic use of ether under the name of

"Letheon," his lawyer advised him that Jackson was entitled to the honor of the discovery. Jackson, however, not wishing his name to be associated with the patent, resigned his interest to Morton for ten per cent. of the profits; but in December, 1846, after hearing of the successes of Wells and Morton, he sent a communication to the French Academy of Sciences, claiming the honor of the discovery of surgical anaesthesia by ether, basing his claims on the grounds that in February, 1842, after his chlorin accident, he had *thought* ether would be applicable to surgery and in 1846 had *suggested* its use to Morton in dentistry.

In 1849, when Morton claimed compensation from Congress on account of the government's infringement of his patent by the use of ether in the army during the Mexican War, Jackson and the friends of Wells (who had committed suicide in 1848), also put in claims, and in 1852 a memorial signed by 143 physicians of Boston and vicinity claiming for Jackson the exclusive discovery of surgical anaesthesia was presented to Congress. Thus was precipitated the "Ether Controversy" which raged in Congress from 1849 to 1854 (See sketch of Long in this paper for account of "Ether Controversy").

"In 1852, the French Academy of Sciences, through Committee, investigated the matter of the discovery and decreed the Monteyon prize (in money) jointly to Jackson (as the discoverer of surgical anaesthesia) and to Morton

(as the first to apply it)" (Da Costa) ; but the prize was refused by Morton as he claimed to be the exclusive discoverer.

Early in 1854, when Long wrote to United States Senator Dawson in Washington claiming *priority* in the use of ether in surgery, Jackson was requested by Dawson to visit Long in Athens, Ga., and investigate the validity of his claims. This Jackson did, March 8, 1854, while on his way to the Dahlonega gold mines; he heard Long's statement, examined the affidavits of his patients and of eye witnesses of his operations and also his account book showing the services rendered Venable (his first patient). Jackson then verified Long's standing and reputation for truth and honesty by calling upon Professors Joseph and John Le Conte of the University of Georgia at Athens, who assured him that there was not a person in that part of Georgia, who knew Long, who would not take his word for any thing he might claim.

Jackson then proposed to lay their claims jointly before Congress, Jackson to claim the discovery of Surgical Anaesthesia and Long the first practical use of it. Upon the rejection of this proposition, Jackson acknowledged the justice of Long's claims, wrote Dawson to that effect, and withdrew from the contest. He afterwards published a paper in the *Boston Medical and Surgical Journal*, April 11, 1861, in which he gave Long the credit, ending his

paper with these words: "Had he written to me in season I would have presented his claims to the Academy of Sciences of France, but he allowed his case to go by default and the Academy knew no more of his claims to the practical use of ether in surgical operations than I did."

"Jackson became insane and died, after seven years of insanity, in an asylum at Somerville, Mass., August 28, 1880, aged 75" (Westmoreland).

Horace W. Wells.

Horace W. Wells was born in Vermont in 1815 (the year of Long's birth), studied dentistry in Boston, where he practiced his profession for one year with Morton as his student and partner, and then moved to Hartford, Conn., leaving Morton in Boston. He had conceived the idea that some anaesthetic might be used in dentistry to prevent pain and had *thought* of the employment of nitrous oxide for that purpose as early as 1840, but without trying it.

On December 10, 1844, Dr. G. Q. Colton, a wandering lecturer, lectured in Hartford and administered nitrous oxide to several persons on the stage who were rendered unconscious of pain, especially one man, Colonel Cooley, who sustained a severe fall and injured his legs. The next day, December 11, 1844, Wells, who had witnessed the performance, had Colton ad-

minister nitrous oxide to him and while he was under its influence a brother dentist, John M. Riggs, painlessly extracted one of his molar teeth, and the same year he used it successfully on 12 or 15 patients and it was employed by other dentists in Hartford. (This was more than two and a half years *after* Long used ether in surgery on March 30, 1842, a little *after* Carlton used ether in extracting a tooth in Long's office in November or December, 1844, but about nineteen and a half months *before* Morton's experiments with ether in dentistry, September 30, 1846, and in surgery, October 16, 1846).

In January, 1845, desiring to secure larger publicity for his discovery, Wells went to Boston and communicated upon the subject with Doctors Jackson, Warren, Hammond, Morton, and others there; and Dr. John C. Warren, Senior Surgeon of the Massachusetts General Hospital, gave him the opportunity to demonstrate the value of his claims to the discovery of anaesthesia in dentistry before the hospital staff and the students of the Harvard Medical School, Morton, his former partner, being also present. He failed to effect complete anaesthesia, the patient screamed with pain during the extraction of a tooth, and Wells left the hospital amid the laughter and hisses of the students. Profoundly depressed he returned to Hartford suffering severely from the shock.

Dr. J. Collins Warren in 1897 said:—"Wells' failure was due to his administration of only an exhilarating dose (of nitrous oxide) which was insufficient to insure anaesthesia. * * * * Wells never perfected the method of administering nitrous oxide and soon abandoned dentistry on account of his health."

Dr. Wm. H. Welch, of the Johns Hopkins Hospital, in 1908, wrote: "Either from the too early withdrawal or inferior quality of the gas the test was a tragic failure which exerted such a depressing influence upon Wells that he soon withdrew from the profession, abandoned his experiments, and four years later (in 1848) ended his own life under distressing circumstances. * * * * There is no reason to doubt that Horace Wells painlessly extracted teeth by its use (nitrous oxide) and that if he had persevered in his efforts he would have been able to perfect the method of producing anaesthesia by this gas and to demonstrate to the world the art of surgical anaesthesia. While he did not achieve this complete success, the credit which belongs to him is large and the name of Horace Wells should be held in honored remembrance. So far as was known (Long's work was not then known in the North) then and for years afterwards, Wells was the first to take the step to which the finger of Humphrey Davy had pointed 45 years before."

Dr. O. W. Holmes in 1893 wrote:—"Both

these gentlemen (Jackson and Wells) deserve honorable mention in connection with the discovery (surgical anaesthesia), but I have never a moment hesitated in awarding the essential credit of the great achievement to Dr. Morton."

"In December 1846, Wells visited Paris on other business, communicated his discovery to the French Medical Societies, and laid his claims as the discoverer of surgical anaesthesia before the French Academy of Sciences which, however, rejected them, as Jackson and Morton had already anticipated him with their claims" (Sims in *Virginia Medical Monthly*, May, 1877).

He returned to America in March, 1847, and the same year published "A History of the Discovery of the Application of Nitrous Oxide Gas, etc."

When Morton obtained his patent for the use of ether, as "Letheon," in surgery, it was against the remonstrance of Wells.

Dr. Wm. H. Van Buren in a letter says:—"In 1847 I was present in the New York Hospital to witness an operation by Dr. Rodgers upon a patient to whom Dr. Horace Wells administered nitrous oxide for the purpose of producing anaesthesia, but the attempt was unsuccessful, as the patient seemed to suffer as much pain as without it."

The rejection of Wells' claims by the French Academy and the dispute as to his discovery together with constant experiments upon him-

self with chloroform brought on insanity and he committed suicide after being arrested in New York for throwing vitriol on the clothes of a woman in the street, dying January 24, 1848, at the age of 33 years.

"Wells was made Honorary Member of the Paris Medical Society and the State of Connecticut and City of Hartford erected, July 2, 1875, a bronze statue to him in Bushwell Park" (Westmoreland and Grandy).

A courteous letter from Mr. C. P. Botsford, Superintendent Board of Health Commissioners and Bureau of Vital Statistics, Hartford, Connecticut, contains the following:—"A single inscription on this monument reads,

"'Horace Wells the discoverer of Anaesthesia December 1844.' The inscription originally read: 'Horace Wells who discovered Anaesthesia.' Some wag, having in mind the controversy, cut in an interrogation point and the inscription was afterwards changed to its present form."

"In 1904 a tablet was erected on the wall of the building now occupying the site of the building in which Dr. Wells' office was situated with this inscription:

"'On this spot Horace Wells, December 11, 1844, submitted to a surgical operation, whereby he discovered, demonstrated, and proclaimed the inestimable benefits of Anaesthesia.'"

In January, 1845, just before Wells went

to Boston, it is said that he administered ether to a man while Dr. Erastus Edgerton Marcy, of Greenwich, Mass., removed a wen from his head without pain. Marcy afterwards, upon this ground, set up a public claim to the discovery of surgical anaesthesia; but this claim was never pushed.

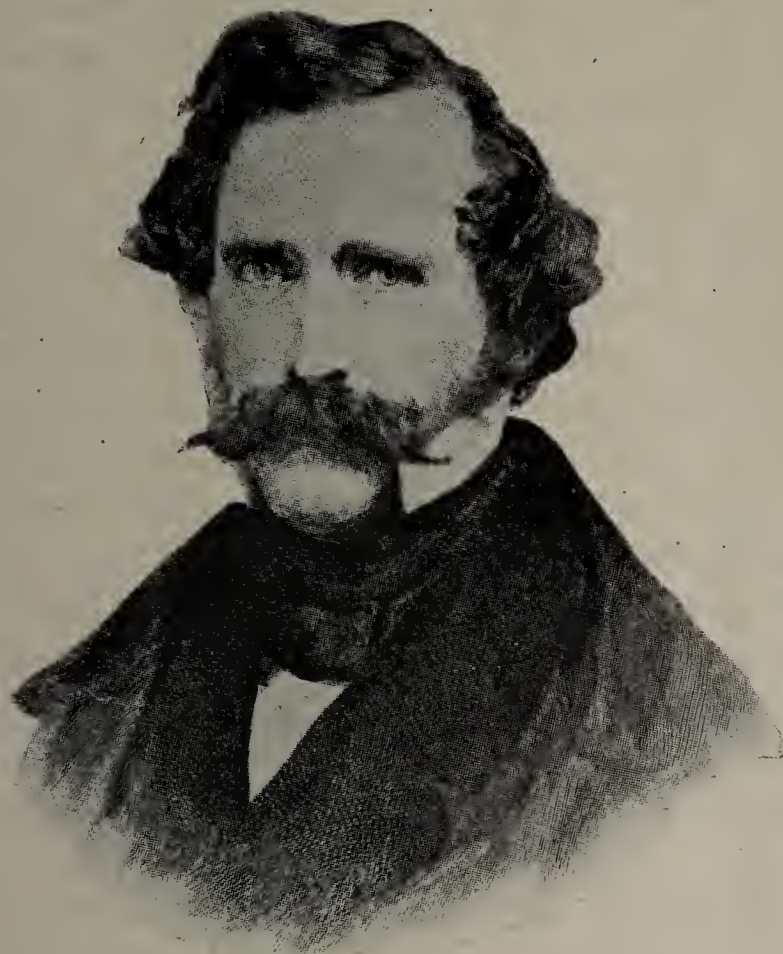
The use of nitrous oxide in dentistry and surgery remained in an unsatisfactory state until 1863, when the technique of its use was perfected by Dr. G. Q. Colton, and after that it became popular in the extraction of teeth and in slight surgical operations of short duration.

William Thomas Green Morton.

William Thomas Green Morton was born in Charlton, Mass., August 9, 1819. His parents were James Morton and Rebecca Needham; his grandfather was Thomas Morton, a revolutionary soldier; and his great grandfather was an immigrant from Scotland who settled in Massachusetts.

Morton was educated chiefly at the Academies of Oxford, Northfield, and Leicester, Mass. In August, 1840, at the age of 21, he entered the Baltimore College of Dental Surgery, "the oldest dental school in the world" (which was connected with the Washington University of Medicine in Baltimore), graduated in 1842, and at once began the practice of his profession in Boston, where he immediately met with

wonderful financial success and was soon regarded as one of the most skilful dental surgeons in Boston. He was the partner of H. W. Wells for one year before he went to Hartford.



WILLIAM THOMAS GREEN MORTON, M. D.

On March 20, 1844, he commenced the study of medicine with Dr. C. T. Jackson of Boston marrying in May of the same year Elizabeth Whitman of Farmington, Conn. he and his bride thereafter living at the home of Jackson. In November 1844 he matriculated in Harvard Medical School but did not graduate there, as

his studies were interrupted by the great discovery of Surgical Anaesthesia. In 1849, however, his Alma Mater, the Washington University of Medicine, conferred upon him the Honorary Degree of Doctor of Medicine. This institution was afterwards merged into the College of Physicians and Surgeons of Baltimore.

For some time Morton had been endeavoring to discover some agent for the prevention of pain in dentistry and was familiar with the work of his former partner, Wells, with nitrous oxide, having witnessed the failure of his experiment in 1845 in the very hospital in which he afterwards won fame (Massachusetts General Hospital).

While attending medical lectures at Harvard he had his attention called to the anaesthetic properties of ether by seeing a man in an "Ether frolic" sprain his ankle without pain. He then experimented with ether upon insects, fish, his pet dog, and finally upon himself, finding thereby that insensibility could be produced by the inhalation of ether vapor which, however, was already well known to the profession through Farady, Pareira, Pearson, Thompson, Godwin, Mitchell, Jackson, Wood, and Bache.

He finally consulted Jackson with regard to the best agent to relieve pain in dentistry, and Jackson, it is said, suggested ether and the apparatus for administering it.

On September 30, 1846, in his office in Boston, Morton administered ether by inhalation to a man, Eben Frost by name, and painlessly extracted a firmly rooted tooth in the presence of one or more of his assistants.

Dr. W. H. Welch of Baltimore says: "Morton undoubtedly received suggestions from Jackson. * * * The evidence seems conclusive that Morton was indebted to Jackson for valuable information concerning the properties of ether and the apparatus for administering it."

Dr. J. Collins Warren of Boston also says: "Morton consulted Jackson as to an inhaling apparatus."

On the day following Morton's successful experiment, public notice of the event appeared in the *Boston Daily Journal* in the following words:—"Last evening an ulcerated tooth was extracted from the mouth of an individual without giving him the slightest pain. He was put into a kind of sleep by inhaling a *preparation*, the effects of which lasted for about three-quarters of a minute, just long enough to extract the tooth."

(This was about four and a half years *after* Long's first operation with ether March 30, 1842, and nearly two years *after* the successful experiments of Carlton with ether in dentistry in November or December and of Wells in December 1844 with nitrous oxide in dentistry).

The above publication induced Dr. Henry J.

Bigelow, of the Massachusetts General Hospital Staff, to visit Morton's office where he witnessed a number of similar dental operations with ether; and the result of this visit was that arrangements were made with Dr. John C. Warren, Senior Surgeon of the Massachusetts General Hospital, whereby Morton was to be allowed to try his discovery in a regular surgical case. Dr. Mason Warren likewise had a hand in these arrangements.

In the meantime Morton, who was an intelligent, brainy, man, recognizing the importance of the discovery, immediately, it seems, took steps to secure whatever benefits might result by taking out a patent upon his discovery.

For the following, see editorial in *Atlanta Medical and Surgical Journal*, February, 1895, and Transactions of Medical Association of Mississippi, 1879:—

“On October 1, 1846, the day following his successful experiment, Morton consulted a lawyer (Mr. Eddy), for the purpose of obtaining letters patent for the discovery of an alleged ‘New Gas’ called ‘Letheon,’ for which anaesthetic effects were claimed. The so-called Letheon was afterwards shown to be ether mixed with aromatic oils which disguised the odor of ether and prevented its recognition, the odor of ether being already well known to the public and profession. Mr. Eddy concluded that Jackson was entitled to the credit, but Jackson would not allow his name to be asso-

ciated with the patent and resigned his interest to Morton for ten per cent. of the profits. On October 27, 1846, Morton published his letters patent announcing the discovery of 'Letheon' as an anaesthetic and proceeded through his lawyer to sell it to individuals and institutions at \$25 per quart and the privilege of using it for five years for \$100. When Morton obtained his patent it was against the remonstrance of Wells, who claimed he had used nitrous oxide in dentistry in 1844 and ether in surgery with Marcy in 1845.

"On October 16, 1846, Morton administered his 'Letheon' by inhalation, the apparatus used being a glass globe and tube for insertion into the mouth improvised by himself, to a man named Gilbert Abbott, while Dr. John C. Warren of Boston painlessly removed a congenital vascular tumor from the side of the patient's neck. The operation was performed in the amphitheater of the Massachusetts General Hospital of Boston, which was crowded with medical men and Harvard medical students. Some of the spectators were among the most distinguished surgeons of the day, as George Hayward, Jacob Bigelow, Henry J. Bigelow, Mason Warren, etc. When the operation, which occupied about half an hour, was over Warren turned to the crowd and said, 'Gentlemen, *this* is no humbug' (probably having reference to Wells' failure of 1844); and Bigelow re-

marked, 'I have seen something today that will go around the world.' "

Morton's claim is that "This was the first public demonstration of Surgical Anaesthesia, from which dates its immediate and universal adoption." Morton was 27 years old and still a medical student of Harvard; but he at once discontinued his studies and "devoted himself to his work"—anaesthesia and his patent.

As there was at that time no word in the language for the *act* of rendering a patient insensible to pain or for the *state* produced thereby, Dr. Oliver Wendell Holmes suggested the words *Etherization* and *Anaesthesia*, which were adopted by Morton. The word "Letheon" (oblivion) had been suggested by Dr. O. O. Gould and was at first agreed to by Morton but afterwards was rejected for the others, while the *agent* itself, ether, was christened "Letheon."

Dr. John C. Warren thus describes the operation of October 16, 1846, which he himself performed: "The patient was a young man, Gilbert Abbott by name, about 20 years old, having a tumor on the left side of the neck just below the lower jaw, which had probably existed from his birth, and seemed to be composed of tortuous indurated veins extending deeply under the tongue. The patient was made to inhale a fluid from a tube connected with a glass globe. After four or five minutes he appeared to be asleep and was thought by

Dr. Morton to be in a condition for the operation. I made an incision between two and three inches long and to my great surprise without any starting, crying, or other indication of pain. The fascia was then divided, the patient still appearing wholly insensible. Then followed the insulation of the veins, during which he began to move his limbs, cry out, and utter extraordinary expressions. These led to a doubt of the success of the application until I had, soon after the operation and on other occasions, asked whether he had suffered pain. To this he always replied in the negative, adding, however, that he knew of the operation, comparing the stroke of the knife to that of a blunt instrument passed roughly across the neck."

Dr. Mason Warren says: "On the following day (October 17) a woman requiring the removal of an adipose tumor from the arm was rendered insensible by ether given by Dr. Morton. and Dr. John C. Warren requested Dr. (George) Hayward, one of the visiting surgeons, to perform the operation. This was successful, the ether being continued through the whole operation."

Dr. John C. Warren later says: "Anxious to extend the benefits of the inhalation to as many patients as possible, I requested Dr. Charles Heywood, house surgeon, to procure a glass globe and add to it the tube necessary for its (Letheon) application. At this period, how-

ever, I was checked by the information that an exclusive patent had been taken out and that no application (of Letheon) could be made without the permission of the proprietor. The knowledge of this patent decided me not to use nor encourage the use of the inhalation until a more liberal arrangement could be made. Dr. Hayward concurred with us and having procured from Dr. Morton a letter of explanation to the surgeons of the hospital, which was judged satisfactory, we felt ourselves justified in prosecuting the practice without restriction."

After the second operation by Hayward Dr. Mason Warren says: "The success of this process (anaesthesia) in the prevention of pain was now established. Its use, however, was suspended for a time, for reasons which Dr. John C. Warren has already given in his first paper on ether (see above), and the experiments were not again resumed until November 7, (1846), when Dr. Morton declared his willingness to state the nature of the agent employed. * * * Two important operations were now done successfully at the Massachusetts General Hospital under its agency: one, an amputation of the thigh, by Dr. Hayward; the other, a very difficult and bloody operation, removal of a portion of the upper jaw in a woman, by Dr. John C. Warren."

On December 21, 1846, Liston, in London, amputated a thigh and removed a toe nail with perfectly satisfactory results and expressed his

delight and surprise in these words: "Hurrah! Rejoice! Mesmerism and its professors have met with a heavy blow! An American dentist has used the inhalation of ether to destroy sensation in his operations and the plan has succeeded in the hands of Warren, Hayward, and others in Boston." Ether was then extensively used for a year when, in 1847. Sir. James Y. Simpson of Edinburgh discovered the anaesthetic powers of chloroform and introduced the use of it into his department, Obstetrics, from which dates the use of anaesthetics in mid-wifery. Chloroform then for many years became the favorite in Great Britain and Europe while ether was chiefly used in America. At present the greater safety of ether gives it almost universal preference.

"On December 15, 1846, Dr. Fisher (of Boston), a medical student in Paris, first gave ether for John de Lamballe, but with only partial success; on January 12, 1847, Maligne (of Paris) reported to the Academy of Medicine the results of four operations performed under ether; and on January 23, Fisher administered ether with a "Boston Inhalor" at the invitation of Roux (in Paris) with perfect success."

Upon the subject of the patent taken out by Morton the following views are of interest:

"In November (12), 1846, Dr. Morton took out a patent for his discovery in the name of

‘Letheon.’ He offered free rights to all charitable institutions throughout the country. In taking out this patent Dr. Morton was badly advised and regretted it.” (See Physicians and Surgeons of America).

“Partly with a view to keeping his discovery out of the hands of persons who might use it unwisely and acting upon the advice of Rufus Choate and Caleb Cushing, lawyers of national reputation, Dr. Morton patented his application of sulphuric ether, but he never enforced the patent.” . (See *McClure’s Magazine*, September, 1896).

“There are circumstances in the conduct of Morton as well as of Jackson, much to be regretted in connection with this great discovery, and especially is it to be deplored that Morton should, if only for a short time, have kept secret the nature of his *Letheon* and that he and Jackson should have patented it.” (Wm. H. Welch, M. D., of Baltimore).

In compliment to Morton, the following expressions deserve mention:

“It seems to me clear that the chief glory belongs to Morton’s deed in demonstrating publicly and convincingly the applicability of anaesthetic inhalation to surgical purposes and *under such fortunate circumstances* that the knowledge became, as quickly as it could be carried, the blessed possession of the whole world. * * * The results and claims of Wells were familiar to his friend and former part-

ner, Morton. I deem it historical justice to say that, in my judgment, the greater share of the honor belongs to Morton." (Wm. H. Welch, M. D.)

"Pain has been conquered and life lengthened by Morton's immortal discovery." (Wm. R. Stokes, M. D., of Baltimore).

"Both these gentlemen (Jackson and Wells) deserve honorable mention in connection with the discovery of surgical anaesthesia, but I have never a moment hesitated in awarding the essential credit of the great achievement to Morton. This priceless gift to humanity went forth from the operating theatre of the Massachusetts General Hospital, and the man to whom the world owes it is Dr. William Thomas Green Morton." (Oliver Wendell Holmes, M. D., in 1893).

On November 19, 1847, Sir James Y. Simpson, soon after his discovery of the anaesthetic effects of chloroform, wrote to Dr. Morton: "In the *Monthly Journal of Medical Science* I have a long article on Etherization, vindicating your claims over those of Jackson. Of course, the great thought is that of producing insensibility, and for that the world is, I think, indebted to you."

The *London Lancet* said: "The discovery of Dr. Morton will undoubtedly be placed high among the blessings of human knowledge and discovery."

It is rather remarkable that Morton com-

mitted the same blunder that Long did in not at once writing and publishing a paper in his own name upon the subject of his great discovery, but allowed another to anticipate him; but it is said he never put anything into print except his letters patent.

“The first publication ever made on the subject of ether as an anaesthetic in surgery (or any other anaesthetic) was a paper written by Dr. Henry J. Bigelow of Boston which was read before the American Academy of Arts and Sciences, November 3, 1846, and published in the *Boston Medical and Surgical Journal*, November 18, 1846, in which he gave to the world an account of the work of himself and his colleagues of the Massachusetts General Hospital with anaesthesia.” (Wm. J. Morton, in the *Postgraduate*, April, 1906, and Taylor, in Transactions of Medical Association of Mississippi, 1879.)

The United States Government infringed the patent right by using ether in the army during the Mexican War and Morton applied to Congress for compensation in 1846 and again in 1849, and Jackson and the friends of Wells (who had committed suicide in 1848) also put in claims, and what is called the “Ether Controversy” (in which Long took no part) raged in Congress for five years, from 1849 to 1854 inclusive.

A bill appropriating one hundred thousand dollars for the discovery was introduced into

Congress in 1852, 1853, and 1854. Congress was in a quandary, being willing to make the appropriation, but uncertain to whom to give it. The advent of Long upon the stage in 1854 finally put an end to the contest (See sketch of Long, this paper), though Morton continued his efforts till 1863 and testimonials in his behalf were signed by prominent physicians in Boston, New York, and Philadelphia.

During September, 1863, Morton, it is said, sued the New York Eye and Ear Infirmary and also Dr. Charles L. Davis of the United States Marine Hospital Service for infringing his patent; but the patent "was shortly declared null and void" as it was shown that the so-called "Letheon" was ether in disguise (See *American Law Register* of September, 1863).

The last years of Morton's life were spent in agricultural pursuits in Wellesley, Mass.

In July, 1868, he went to New York in order to reply to an article just published that advocated Jackson's claims in the great discovery and by which he was greatly agitated. While driving with his wife during the early part of a hot night he complained of feeling sleepy and just as they were leaving Central Park he suddenly sprang from the carriage and quickly became unconscious, dying of apoplexy in the ambulance on the way to St. Luke's Hospital, July 15, 1868, aged 48 years. He was buried in Mount Auburn Cemetery in Boston.

In 1852, when the French Academy awarded the Monteyon prize (in money, 5,000 francs) jointly to Jackson (as the discoverer of surgical anaesthesia) and to Morton (as first to apply it), and Morton declined the prize, claiming the exclusive honor, it resulted in his receiving the same year from the French Academy the large gold medal, the Monteyon prize in Medicine and Surgery.

Russia invested him with the "Cross of the Order of St. Vladimir," and Sweden and Norway with the "Cross of the Order of Gustavus Wasa," and the Massachusetts General Hospital gave him a silver box containing \$1,000, "In honor of the ether discovery of September 30, 1846."

The citizens of Boston erected a marble monument to Morton in Mount Auburn Cemetery in Boston with the following inscription:

"WILLIAM THOMAS GREEN MORTON
INVENTOR AND REVEALER OF ANAESTHETIC IN-
HALATION,
BEFORE WHOM IN ALL TIME, SURGERY WAS
AGONY,
BY WHOM PAIN IN SURGERY WAS AVERTED
AND ANNULLED,
SINCE WHOM SCIENCE HAS CONTROL OF PAIN."

Morton's name is enrolled upon the base of the dome in the new chamber of the House of Representatives in the State House in Boston among the selected 53 of Massachusetts' most

famous citizens. His name is also enrolled upon the medallions of the new public library of Boston among the 550 names chosen from the records of historical time in honor of their achievements.

“During the Civil War, Morton was with Burnside at the Battle of Fredericksburg and with Grant during the battle of the Wilderness, and in one week administered ether 2,000 times for operations upon the wounded soldiers, Confederates as well as Federals, producing perfect anaesthesia in an average time of three minutes.”

Among the names of distinguished men who, it is stated, gave Morton credit as the true discoverer, we find the following: “Daniel Webster, Charles Sumner, R. H. Dana, Edward Everett, Samuel Houston, James Russell Lowell, Henry W. Longfellow, Oliver Wendell Holmes, and others; and among those of noted physicians, the following: Doctors, Bigelow, Warren, Bowditch, Parker, Mott, Buck, Van Buren, Thomas, Smith, Sayre, Delafield, and others.

Note—Knowing that there is in Boston a monument of white marble connected with the Discovery of Surgical Anaesthesia, I wrote to the Mayor and Health Department of that city and among other letters I received the following:

Health Department,
Boston, Mass., Sept. 1, 1914.

Dr. E. M. Magruder,
Charlottesville, Va.

Dear Doctor:—The inscriptions on the monument in Boston are as follows:

NEITHER SHALL THERE BE ANY MORE PAIN.

TO COMMEMORATE THE DISCOVERY THAT THE IN-
HALING OF ETHER CAUSES INSENSIBILITY TO
PAIN. FIRST PROVED TO THE WORLD AT
THE MASSACHUSETTS GENERAL HOS-
PITAL IN BOSTON. OCTOBER, A. D.,
MDCCCXLVI. (1846).

THIS ALSO COMETH FROM THE LORD OF HOSTS
WHICH IS WONDERFUL IN COUNSEL AND
EXCELLENT IN WORKING.—*Isaiah*.

IN GRATITUDE FOR THE RELIEF OF HUMAN SUF-
FERING BY THE INHALING OF ETHER A CITIZEN
OF BOSTON HAS ERECTED THIS MONUMENT.

A. D., MDCCCLXVII. (1867).

THE GIFT OF THOMAS LEE.

Yours very truly,
F. H. SLACK,
Secretary Boston Health Dept.

“The above monument was erected during Morton’s life time and consequently was not to

his memory. The subject of it is, 'The Good Samaritan.' "

F. A. WASHBURN,
Resident Physician, Mass. Gen. Hospital,
Boston, Mass.

Crawford Williamson Long.

James Long, great grand-father of Crawford W. Long, was born in the north of Ireland and emigrated in 1762 to Carlisle, Pennsylvania.

Capt. Samuel Long, grand-father of Crawford, was born in Donegal County, Ireland, and came at the age of nine with his father to Carlisle. His wife was Ann Williamson who had also been born in the north of Ireland. Capt. Long fought through the revolution under Washington and LaFayette and in 1792 moved with his family to Madison County, Georgia.

James Long, father of Crawford, was born at Carlisle, Pennsylvania, in 1781 and, at the age of 11 or 12 years, moved with his father to Madison County, Georgia. When old enough he began business at Danielsville, the same County, and married Elizabeth Ware, the daughter of his neighbor, Edward Ware. He served in the State Senate of Georgia and was the intimate friend and adviser of the great statesman, William H. Crawford of Georgia.

Edward Ware, the maternal grand-father of Crawford W. Long, was born in 1760 in Old Albemarle County, Virginia. He was a ser-

geant in the Revolutionary Army under La-Fayette at Yorktown, and his wife, Sarah Thurmond, was also of Old Albemarle County, Virginia. After the war, they emigrated with



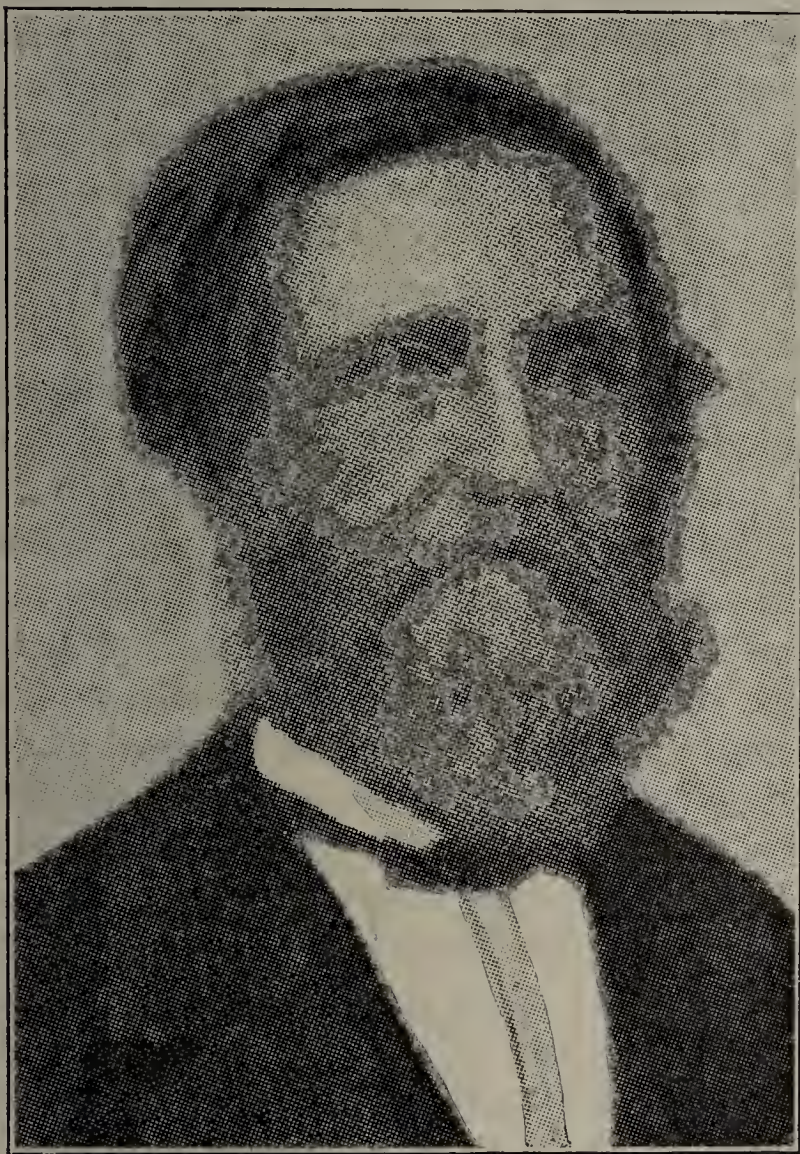
**BRONZE MEDALLION UNVEILED IN THE MEDICAL BUILDING
OF THE UNIVERSITY OF PENNSYLVANIA, MARCH 30, 1912,
TO THE MEMORY OF CRAWFORD WILLIAMSON LONG, M. D.**

The Medallion was Designed by Profesor R. Tait McKenzie

their daughter, Elizabeth, from Virginia to Madison County, Georgia.

Elizabeth Ware, mother of Crawford W. Long, was born in 1789 in Amherst County, Virginia, and moved with her father to Madi-

son County, Georgia. "Long came of excellent stock, inheriting intelligence, the instincts of a gentleman, and sympathy for suffering."



CRAWFORD W. LONG, M. D.
(Late in Life)

Crawford Williamson Long, the son of James Long and Elizabeth Ware, named for the great statesman and for his paternal grand-mother's

family, was born at Danielsville, Georgia, November 1, 1815. When 14 years old he attended Franklin College, now the University of Georgia, at Athens, where he took the degree of Master of Arts at the age of 19, "being considered 'studious and wise' beyond his years and called 'The Baby' at College on account of his extreme youth. He stood second in the graduating class." His room-mate and best friend at Franklin College was Alexander H. Stephens, afterwards Vice-President of the Confederacy. Long then taught school and took a medical course of one year at Transylvania University at Lexington, Ky. In the fall of 1837 he entered the University of Pennsylvania, at Philadelphia, as a medical student and graduated in medicine in 1839, in 2 years, at the age of 23 years. He then went to New York and spent eighteen months "walking the Hospitals", specializing in surgery, and witnessing much painful surgery. He there attained reputation as a skilful surgeon.

In 1841, when 26 years old, he settled in Jefferson, Jackson County, Georgia, and commenced the practice of general medicine. "soon acquiring an extensive and lucrative practice. His house in the village became a favorite social resort for the young men of the neighborhood."

"Long, when a student in the North, had inhaled ether during an 'Ether Frolic' and was familiar with its effects. In December, 1841,

several young men while in his office in Jefferson requested him to allow them to inhale nitrous oxide, as they had heard of its delightful effects. Not having any of this he substituted sulphuric ether, which he considered as safe as the other, and administered it both to himself and to all present. They were so much pleased with its exhilarating effects that the report spread and the inhalation of ether, first begun in that section in Long's office among his young men companions, became so popular and fashionable in the village and surrounding counties of Georgia that almost every private entertainment ended with one of Dr. Long's 'Ether Frolics' for which he became famous and in which he administered the drug not only to others but to himself, but never to the extent of complete unconsciousness. Thus inhaled ether produced great exhilaration and excitement, causing those using it to engage in curious and amusing antics to the great delectation of the onlookers.

"It was in December, 1841, that Dr. Long introduced the inhalation of ether for its exhilarating effects in Jefferson, Georgia, and it was immediately after the *first* occasion of his use of ether in this way and frequently after other 'ether frolics' that he 'discovered bruises and painful spots on himself and friends, which they had no recollection of receiving while under the influence of ether'" (Long). He also noticed that his friends while ether-

ized received falls and blows sufficient to produce pain but, when questioned, they all assured him that they had felt no pain at all. According to the statement of his family, during Christmas week (1841) Long confided to his friend, R. H. Goodman, that he believed ether had the power of rendering a person insensible to pain in a surgical operation, and in February he determined to use it in surgery. But Goodman himself in his affidavit states, "In November, 1841, Dr. C. W. Long told me that he believed an operation could be performed without the patient feeling any pain by giving him ether to inhale."

These events happened a little while *before* Jackson inhaled ether in February 1842 to relieve the suffering from chlorin poisoning and *thought* that it might be useful in surgery. Thus the same idea occurred to each independently of the other and near the same time, but while Jackson did not try it Long put *his* thought into successful practice.

On March 30, 1842, in his office in Jefferson, Georgia, Dr. Crawford W. Long administered ether by inhalation to James M. Venable (a young white man who had previously inhaled ether at "frolics") and removed from the back of his neck a small encysted tumor half an inch in diameter. The ether was given by being poured upon a towel held over the nose and mouth of the patient who "continued to inhale it during the time of the operation."

He gave no evidence of suffering and assured Dr. Long afterwards that he had felt no pain.

This was the first authentic surgical operation with an anaesthetic ever performed in the history of the world.

This operation was performed about two and a half years *before* Wells used nitrous oxide in extracting teeth and about four and a half years *before* Morton's operations with ether in dentistry and surgery.

On June 6, 1842, Long successfully repeated the above operation with ether upon the same patient by removing a second small tumor from the back of the neck. These operations were witnessed by Wm. H. Thurmond, A. T. Thurmond, J. E. Hayes, and E. S. (L.) Rawls.

On July 3, 1842, Long performed his third operation with ether, amputating the toe of a negro boy without pain.

On September 9, 1843, he removed three wens from the head of a woman, Mrs. Mary Vinson, one painlessly with ether, and the other two without ether and with severe pain. This operation was witnessed by William Vinson, husband of the patient.

On January 8, 1845, he amputated two fingers of a negro boy, one painlessly with ether, and the other without ether and with a great deal of pain. The reason the second amputation was done without ether was to make sure that the freedom from pain in the first was

due to the ether. This operation was witnessed by Milton Bailey and G. L. Thompson.

In the summer of 1846 he painlessly extracted a tooth for Mary E. Ware while the latter was under the influence of sulphuric ether.

According to Dr. Hugh H. Young, "Long performed at least eight minor operations such as the removal of small tumors, fingers, and toes, with ether anaesthesia before Morton made his discovery." He later used ether frequently in removal of the female breast and in amputation of the thigh and other limbs, etc., but the opposition of the older physicians of the vicinity and the ignorance and prejudice of the public prevented his using it as often as he might have done, though he continued to employ it in surgery to the time of his death; he even employed it in obstetrics.

"He operated for cancer of the breast by removing the breast, clearing the ribs of all muscle tissue, and removing the axillary glands, the exact counterpart of the modern Halstead operation" (Chiles in *Munsey*, August, 1911).

For the first operation on Venable, Long, having previously told Venable that he would do the work for a nominal fee, charged two dollars including the cost of the ether which was 25 cents. "He never charged over one hundred dollars for a breast operation" (Da Costa).

Long's affidavits abundantly and convinc-

ingly prove that from the first he made no secret of his discovery but verbally imparted the knowledge of it to the physicians of his section of Georgia and urged them to use it, and that it was known and discussed far and wide over the State. They also show the dates of his surgical experiments with ether, that his operations were public and notorious in Georgia, that he made no attempt to conceal the character of the article inhaled, and that he made no request that the results of his operations be kept secret (see affidavits of Dr. De Laperriere, Dr. Wilhite, Dr. Camak, Pendergrass, Hayes, Mrs. Carlton) ; but most of the physicians who heard of it feared fatal effects and in only one case was ether used by any other physician in that section:—Dr. J. B. Carlton of Athens, twenty miles from Jefferson, while on a visit to Long, was induced by the latter, in November or December, 1844, to employ it in the extraction of a tooth in his (Long's) office. This happened a little *before* Wells used nitrous oxide, December 11, 1844, for the same purpose.

In May, 1843, Dr. R. D. Moore of Athens amputated a leg and said to his three student assistants, "If I had thought of it before leaving home I would have tried Dr. Crawford W. Long's great discovery, producing insensibility by the inhalation of ether." This operation was done with the patient under the influence of morphine as no ether was at hand (affida-

vits of Drs. Carlton and Camak who were present.)

Long made a great mistake in not at once publishing in some medical journal his experiments, which he did some years later, in 1849. Dr. Henry L. Bigelow published his paper, on Merton's use of ether in surgery, November 18, 1846. Long read this report in December of the same year and at once began the preparation of a paper upon his experiments; but after writing a few lines he abandoned it until 1849, owing to the demands of a large practice.

The causes of Long's delay in publishing his discoveries were well founded:

1. "He desired first to test it further in a number of cases, and especially in a capital operation, which he had not done (Long), in order to furnish exhaustive proof of the reality, safety, and efficiency of anaesthesia. He was then living in a sparsely settled country in which surgical cases were scarce and there was no opportunity to rapidly verify results by frequent operations as in a large city hospital (Long). Jenner waited 20 years before he published his experiments with vaccination" (Da Costa).

2. "Ignorance and prejudice on the part of the public and religious fanaticism, which claimed that the Almighty had decreed that the human race should suffer pain, prevented his using anaesthesia as often as he would have done." He was more than once threatened by

the community with mob violence (as was Jenner) if he persisted in the use of ether.

3. "The older physicians around were averse to his experiments and afraid to try them and urged upon him the danger of the method and the disastrous results that would follow a fatal accident which, they declared, was sure to occur."

4. "He was very young (26 years old), modest, and retiring, and feared he might be discredited in the eyes of the profession as a visionary imposter" if he put forward such seemingly preposterous claims as anaesthesia in surgery.

5. "The public and some of the profession were in favor of hypnotism or mesmerism as an anaesthetic, which had been successfully practiced in India, the United States, and France; but Long regarded it with disfavor" (Buxton and Da Costa).

In December, 1849, however, Long published in the *Southern Medical and Surgical Journal*, Augusta, Ga., his first paper with some of his affidavits in which he set forth his claims to priority of discovery and use of the anaesthetic properties of sulphuric ether in surgery; and later, in 1852, he read a paper upon the same subject before the Medical Association of Georgia. His claims were unanimously endorsed by the Association which recommended that they be presented to the American Medical Association at its next meeting (Tran-

sactions Medical Association of Georgia, 1852).

In the language of Dr. Young, "For five long years Long refused to take part in the conflict in Congress but, finally, early in 1854, persuaded by his friends, he wrote to United States Senator Dawson of Georgia giving an account of his work and modestly claiming *priority* in the discovery and use of surgical anaesthesia"; and this is all that he ever did claim. There was in his conduct towards his rivals no envy nor malice nor desire to belittle their work which he commended and appreciated as a great achievement; but he knew that his work antedated theirs and he claimed only his dues..

"Senator Dawson wrote to Jackson of this new claimant and requested him to investigate his case by visiting Long at Athens, Georgia, where he had been living since 1851."

On March 8, 1854, Jackson, on his way to some gold mines, visited Long, heard his statement, examined the affidavits of his patients and of persons, medical and lay, who had witnessed his operations and also his account book showing the services rendered Venable. He then verified Long's standing and reputation for truth and honesty by calling upon Professors Joseph and John Le Conte of the University of Georgia at Athens, who assured him that Long was absolutely honest, honorable, and trust-worthy.

Jackson then proposed to lay their claims

jointly before Congress, Jackson to claim the discovery of Surgical Anaesthesia and Long the first practical use of it. This proposition was rejected and Jackson then acknowledged the justice of Long's claims to priority in the surgical use of ether, wrote Dawson to that effect, and withdrew from the contest. On April 11, 1861, he published a paper in the *Boston Medical and Surgical Journal* in which he gave Long credit for prior discovery and use.

"Long declined all of Jackson's suggestions and instructed Senator Dawson to make no compromise but to place his claims solely on their merits" (Grandy).

The interview between Long and Jackson was most amicable and Long afterwards in a letter to Jackson wrote, "I entertain high respect for you as a gentleman and man of science and feel honored by your acquaintance."

The appropriation bill of Morton, called Senate Bill 210 and entitled "An Act to Recompense the Discoverer of Anaesthesia" recites "That a discovery of anaesthesia had been made by some one of the following persons, W. T. G. Morton, Chas. T. Jackson, and Horace Wells, but that it does not appear clear to Congress which of those parties was the original, true, and first, discoverer thereof." It then proposes to appropriate one hundred thousand dollars as a recompense for the real discoverer. In order to determine this, it was

directed that proceedings be instituted in the United States Circuit Court of Northern New York, "the Secretary of the Treasury being the complainant, and Morton, Jackson, and representatives of Wells, or any other person who may make application to the Court for that purpose, being the defendants" (*Congressional Globe*, April 21, 1854).

"On April 15, 1854, the bill was before the Senate for its final reading when Senator Dawson arose and said that he had a letter from Dr. Jackson which acknowledged that a 'Dr. Long in Georgia' had undoubtedly used ether in surgery before any of the claimants for the appropriation" (Young). This announcement acted like a bomb shell and paralyzed all further proceedings.

Finally, on April 19, 1854, this bill, after having the name of "Dr. Long of Athens, Georgia", added at the suggestion of Dawson along with the names of Morton, Jackson, and Wells, was passed by the Senate (*Congressional Globe*, 1', 33,' Part 2, P. 943).

The reason Long's full name was not inserted in the bill was that Dawson did not have Jackson's letter with him and had forgotten the full name. Two days later, on April 21, 1854, the same bill was brought up before the House and was "laid on the table" awaiting further developments. "But Long stopped there and refused to press his claims, saying that he did not desire recognition by Congress

nor any pecuniary compensation but only recognition by the medical profession." He wished to bring the dispute before the American Medical Association but was informed that that body could not concern itself with controversial matters.

Young goes on to say, "Long's work was unknown to the world at large until 1877 when Dr. J. Marion Sims, formerly of Georgia but later residing in New York, investigated his claims, was fully convinced of their merits, and published a paper in the *Virginia Medical Monthly* of May 1877, vigorously demanding their recognition by the medical profession. Soon after the publication of Sim's paper letters began to pour in upon Long from distinguished physicians and surgeons all over the world recognizing his claims to priority in discovery and extending their congratulations, and his declining years were rendered happy by the consciousness that he had at last come into his own and received that credit which had been so long withheld."

Dr. Crawford W. Long died June 16, 1878, at the age of 62 years, in Athens, Georgia, where he had lived and worked since 1851 and where he now lies buried. He was stricken with apoplexy and became unconscious at the bedside of a patient, the wife of his friend, Dr. H. H. Carlton, whom he was attending in confinement. He was carried to another room in Carlton's house where he died the next day.

On regaining consciousness, which he did before death, he asked, "How is she?", and gave directions for treating the patient.

The original manuscript proofs of Long's priority in the discovery and use of surgical anaesthesia are stored away in a bank vault in Athens, Georgia. They are in the form of affidavits obtained from his patients, from eyewitnesses of his operations, and from physicians and medical students who had witnessed and heard of his discovery. Six photographic copies of these papers have been presented to various institutions of learning both in this country and abroad, one copy being on exhibition in the Medical Museum in London and one in Dublin. Manuscript copies of these affidavits are also among my own highly prized possessions.

"During the Civil War Long was in charge of the Confederate Hospital at Athens, Georgia, and after the close of hostilities he was appointed by the United States Government as Surgeon to the Union troops stationed there. Such was his reputation as a man and a surgeon that no oath of allegiance to the Government was required and he was thanked for his humanity and skill."

"Many Medical Societies and the Eclectic Medical Association have passed decrees in Long's favor."

"Foreign Medical Journals, even those of

Australia, give Long the credit of priority of discovery and use of surgical anaesthesia.

“Dr. Dudley Buxton, of London, recently read a pamphlet before the Royal Society of Medicine, advocating Long’s claims.”

Among the advocates of Dr. Crawford W. Long as the first discoverer and user of surgical anaesthesia, I wish to mention especially George Foy, M. D., F. R. C. S., F. A. M., a distinguished surgeon and writer of Dublin, Ireland, who has worked and written a great deal upon this subject to advance the claims of Long in the British Empire and in Europe. His writings have a world-wide circulation and he is an honorary member of the Medical Societies of Virginia and Georgia.

Dr. David Cerna, Coahuila, Mexico, member of the Academy of Sciences, says: “It is but fitting that the Legislature of Georgia should place the statue of Crawford W. Long in the National Gallery of Statues in the City of Washington. But that is not enough. A statue of Crawford W. Long should be raised in every medical school, in every hospital, in every public institution, the world over” (*Texas Medical Journal*, Translated from *La Escuela de Medicina*).

Long’s portrait hangs in numerous colleges and hospitals, in the Anaesthetists’ Hall of the Royal Society of Medicine in London, and a large life size portrait of him hangs in the Capital of Georgia, which was the gift of

Henri Stuart of New York and was accepted by the Legislature in 1879 with imposing ceremonies.

The Medical Association of Georgia in 1910 unveiled a marble monument to him at Jefferson, Georgia, where his discovery was made; it was donated by L. G. Hardman of Georgia.

The Infirmary connected with the University of Georgia at Athens is a Long Memorial.

In 1912 the University of Pennsylvania unveiled in its medical building a bronze medalion, with the inscription;

TO THE MEMORY OF CRAWFORD W. LONG
WHO FIRST USED ETHER AS AN ANAESTHETIC
IN SURGERY MARCH 30, 1842.

The State of Georgia, through her Legislative Committee on Appropriations, has already signified her intention to place a statue of Crawford W. Long in Statuary Hall, Washington, D. C., along with that of his friend, Alexander H. Stephens, as soon as the finances of the State warrant an appropriation for the purpose. (It was Stephens who, in 1878, soon after Long's death, when asked to suggest the names of two of Georgia's famous men for Statuary Hall, suggested those of Long and Oglethorpe).

"In Paris stands a life size marble statue of Crawford W. Long" (Grandy and Buxton).

In determining the merits of the work done by the several claimants of the honor of giving

surgical anaesthesia to the world, it seems that the following questions arise for consideration:

1. Who discovered Surgical Anaesthesia?
2. Who was the *first* to discover and employ surgical anaesthesia?
3. Foundation upon which claims rest?

There is no doubt that this discovery was made by three men, Crawford W. Long, Horace W. Wells, and William Thomas Green Morton, independently of each other.

2. There can also be no doubt that to Crawford Williamson Long belongs the honor of being the first to discover and use Surgical Anaesthesia, and acknowledgment is now made to him the world over, in Great Britain and Ireland, France, Germany, Russia, Australia, Mexico, and the United States. New England, however, is divided in sentiment between the claims of Wells and Morton respectively, as the true discoverer, and celebrated the fiftieth anniversary of Morton's discovery in Boston in 1896.

But Long deserves more than credit for priority of discovery and application; for his freedom from mercenary motives, his fairness to his rivals, his modest, dignified, demeanor throughout the trying ordeal of "The Ether Controversy", and his refusal to engage in unmannerly squabble even at the risk of his glory, showed his clear title to "The grand old name of Gentleman."

But while Long was undoubtedly the first to

use an anaesthetic in surgery we must not refuse credit to Wells and Morton for earnest effort and independent discovery along this line; and it is probable that, if any two of this trio had failed to make the discovery or to publish it, the other undoubtedly would have conferred the boon, for the thought and ambition of all three independently reached the goal within a period of four and a half years, each through the needs of his profession.

3. *The claims of Jackson* were founded only upon theory and *suggestion* to others, not upon practical demonstration. He did no experimental work in this line and, being a physician and knowing the needs of the profession, he deserves less credit than Sir Humphrey Davy who, though not a medical man, yet in 1799 *suggested* the use of nitrous oxide in surgery, but he never claimed that he had discovered surgical anaesthesia. Jackson discovered nothing and his claims may be thrown out, though it seems that he gave at least *some* assistance to Morton in the choice of ether and the apparatus for administering it.

The claims of Wells were founded upon practical demonstration both upon himself and others. He certainly discovered *something* without the aid of anyone and at a voluntary risk to his life and deserves great credit for courage and originality and independence of thought and action. He also made an effort, without concealment or reservation of any

kind, to publish his discovery to the world by practical public demonstration in the greatest seat of learning (Boston) and in the greatest hospital at that time in America (Massachusetts General Hospital). But he let his discovery slip away from him through lack of perseverance in pushing his highly promising work to the goal and allowed two public failures to draw him back from the brink of success. If success had not come to others we know not what effect his earlier successful experiments would have had, nor how long the blessing would have been delayed by his discouragement and surrender; but his work would certainly have been a long step towards discovery and "his name deserves honored remembrance" for his intelligent effort and near success. Wells's discovery and demonstrations were made December 11, 1844.

The claims of Morton rest upon practical demonstration by himself; but while the anaesthetic possibilities of ether came to him from the same source as to Wells and Long—a nitrous oxide or ether frolic—it seems, according to Welch and others, that he did not act entirely upon his own initiative in the final stage, but was influenced partially at least by suggestion and information obtained from Jackson; and the fact that he let Jackson in on the patent would indicate that he was not sure of exclusive right. He deserves very high credit though for intelligence and independent

research and perseverance in pushing his work to complete success undaunted by the failure of Wells. He made a grand discovery "that resulted in immediate universal publication and adoption," which was his claim, but his glory is dimmed by his commercialization of a discovery upon whose quick dissemination depended the prevention of untold suffering. When the Boston surgeons first used anaesthesia they knew not what the agent was and had not the disclosure been *forced* by them, who can measure the suffering caused by the inconvenience, expense, and delay, attending the world-wide introduction of a patented article? Morton's discovery and demonstration were made, in dentistry, September 30, 1846, and in surgery, October 16, 1846.

The claims of Long rest upon practical demonstration by himself, the result of his own unaided thought and research, almost in the wilderness, far from the centers of science and learning, in a country furnishing but few surgical opportunities and no hospital or publication facilities, and abounding in professional opposition and public prejudice.

Yet under these adverse circumstances this man made the grandest discovery of the universe and practiced surgical anaesthesia persistently from the time of his discovery, several years before that of any one else, until his death, undaunted by opposition and super-

stitution. Long's discovery and demonstration were made March 30, 1842.

CRITICISM OF LONG BY HIS OPPONENTS.

1. It has been charged that "Long did not himself administer the anaesthetic, but that the patient administered it to himself, that the anaesthesia was not carried beyond the stage of exhilaration, and that he did not carry his experiments far enough to reach a decided result."

Dr. Long, in his paper read before the Medical Association of Georgia, says; "The ether *was given* to Venable (his first patient) on a towel and *when fully under its influence* I extirpated the tumor; the patient *continued to inhale ether during the time of the operation*; he gave no evidence of suffering during the operation and assured me after it was over that he did not experience the least degree of pain."

E. S. Rawls, who witnessed Long's first operation on Venable states; "Said Venable *was fully under the effects of the vapor of sulphuric ether inhaled from a towel and without his exhibiting the least symptoms of suffering pain from the operation.*" Rawls was familiar with the odor of ether at "frolics."

Dr. J. F. Groves, who entered Long's office in May, 1844, as his first medical student and who assisted him in some of his work, in a letter to one of Dr. Long's daughters says: "Not satisfied that there was not more to learn about this great discovery he (Long) proposed

that we test it further personally, which we did in his office, when we administered it to each other to prove its perfect anaesthetic effect and also to discover any bad effect to the subject etherized." And in a letter to Dr. Young the same writer says: "The patient was placed in a recumbent position on a bed; *Dr. Long* poured ether on a towel and held it to the patient's nose and mouth; *Dr. Long* determined when the patient was sufficiently etherized to begin the operation by pinching or pricking him with a pin. *He (Long) profoundly anaesthetized the patient*, then gave me the towel, and I kept up the influence. The patient *was entirely unconscious*—no struggling—patient passive in the hands of the operator."

A study of Long's affidavits shows that in every operation but one the patient was so profoundly anaesthetized that absolutely no pain was experienced. The only exception was in the second operation on Venable with regard to which Venable says:—"In this operation I did not feel the least pain until the last cut was made when I felt a little pain." This is all the foundation for the charge that "Long's anaesthesia was not carried beyond the stage of exhilaration." Long himself appreciated the importance of pushing the anaesthesia, for, in his first paper in the *Southern Medical and Surgical Journal*, he says, "The result of my second experiment (on Venable) was such as led me to believe that the anaesthetic state was

of such short duration that ether would only be applicable in cases in which its effects could be *kept up by constant inhalation during the time of the performance of the operation.*"

These affidavits show that *Long did administer the ether himself*. But even if Long had not given the ether himself but had it given by someone else or even by the patient, he would have been equally responsible and would have deserved the same credit as if he had administered it himself. Dr. Gorgas did not himself actually banish yellow fever and malaria from the Panama Canal Zone, but he showed how it should be done and had the work done by others. The above statements likewise prove that the anaesthesia *was profound and was carried beyond the stage of exhilaration* and that *decided results were reached* as there was absolutely no pain in all but one. The anaesthesia in Long's case was far more profound than in Morton's first surgical case, for Warren, who performed the operation for Morton, says: "Then followed the insulation of the veins during which he (the patient) began to move his limbs, cry out, and utter extraordinary expressions." I do not, however, consider this of sufficient importance to split hairs over, as both cases were sufficiently anaesthetized for practical purposes.

2. It is also asserted that "Long did not seem to appreciate the great value of the discovery and that he admitted he abandoned it."

Long's numerous affidavits abundantly and convincingly prove that he *did* show appreciation of the discovery by freely speaking of and discussing it with other physicians, medical students, and the laity; by urging other physicians to employ it; by experimenting with it upon himself; and by continuing to employ it whenever opportunity offered until his death. The idea that Long ever abandoned his discovery will probably be news to his friends; there is absolutely no evidence that he did and every thing points to the fact that he continued to use it all the rest of his life, as positively stated by his own children now living.

2. The claim is made that "Long made no publication of his experiments nor of their results until December, 1849, after the universal adoption of surgical anaesthesia."

The truth of this depends upon the meaning of the word "publication." Webster says "publication" means "notification to the people at large, either by *words*, writing, or printing." Long's affidavits prove conclusively that he did make verbal publication of his experiments from the very first and continually afterwards to the public and profession without discrimination. He never ceased to urge its employment by the medical profession. His operations were as public as they could be, when his environment is considered, as there were always others present to witness

them; but he had none of the facilities of a hospital nor the aid of world famous surgeons to furnish clinical material for rapid verification, demonstration, and publication; there were convenient no news-papers, medical journals, railroad, telegraph, nor steamboat, to disseminate the news in centers of population and in distant parts of the earth; he made no secret of the agent used nor enjoined secrecy upon others; his discovery was known and discussed in medical and lay circles over a large extent of territory, and if the great scientific centers and the world at large were ignorant of his work, it was through no act or desire of his. His own incontrovertible evidence is sufficient to prove that he was the first to achieve the goal of surgical anaesthesia and to present this priceless blessing to a land that too long failed to appreciate the gift. Neither Jackson, Wells, nor Morton, ever printed anything concerning their discovery; though Wells, in 1847, did publish "A History of the Discovery and Application of Nitrous Oxide Gas; etc."

Dr. W. H. Welch says: "Especially are they (the surgeons of the Massachusetts General Hospital) to be commended for their insistence upon disclosure of the nature of the secret *Letheon*," which Morton did not disclose even to physicians until forced to do so. Thus it will be seen that while Long freely and

voluntarily gave his discovery to the public, Morton was forced to disclose his.

The nearest hospital, medical journal, and railroad to Long's home town were at Augusta, Ga., 140 miles distant, with only a country dirt road between the two places; the nearest newspaper was a weekly at Athens 20 miles away.

4. It is charged that "Long presented his claims to Congress, but that his evidence failed to convince the House that he was entitled to the credit of the discovery of surgical anaesthesia."

Long was very ethical in all his professional conduct; he did not desire political recognition nor pecuniary reward for his achievement, nor would he have accepted any. His appearance in the congressional arena was simply to defeat plans which, if successful, would have tended to deprive him of what he considered his own inalienable rights and, having accomplished his purpose, he abstained from urging his claims further before Congress, as he did not consider *that* the proper body to decide the question of the discovery, and allowed the matter to go by default. His only desire was the recognition of the medical profession which, though delayed, came to him finally.

5. It has likewise been alleged that P. A. Wilhite was a medical student in Long's office in 1842; that he told Long of his having thoroughly anaesthetized a negro boy in an "ether

frolic" in 1839, and had thus encouraged Long to use ether in surgery; and that he had witnessed his first operation in 1842.

It is proved by Dr. Groves, Long's first medical student, and by Dr. Long himself that Wilhite was not a student in Long's office till 1845; Long himself also stated that he had never heard of Wilhite's having anaesthetized the negro boy; and Wilhite afterwards, in a letter to Long, confessed that he had not witnessed Long's first or second operation. So much for the Wilhite claims!

CONCLUSION.

An impartial consideration of the facts brought out in this paper will show that the two principal actors in the great Discovery of Surgical Anaesthesia were Long and Morton; and that while both made the discovery and demonstrated its complete success, their claims in the matter need not really conflict.

Long can justly claim *priority of discovery* with immediate practical demonstration and verbal publication of the *real* agent and its effects, and that *unfavorable* environment prevented immediate and universal adoption of his discovery.

Morton can rightfully claim *later* discovery with immediate practical demonstration and verbal publication of a *secret* agent and its effects, and that through most *favorable* environment his discovery was followed by immediate universal adoption.

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